



# Cisco

## 642-883 Exam

### Cisco Deploying Cisco Service Provider Network Routing (SPROUTE) Exam

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## Version: 10.0

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### Question: 1

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Refer to the OSPF command exhibit.

```
RP/0/RSP0/CPU0:P1(config-ospf)#area 1 stub no-summary
```

Which effect does the no-summary command option have?

- A. It will cause area 1 to be able to receive non-summarized inter-area routes.
- B. It will cause area 1 to not receive any inter-area routes and will use a default route to reach networks in other areas.
- C. It will cause area 1 to not receive any external routes and will use a default route to reach the external networks.
- D. It will convert the NSSA area into a NSSA totally stubby area.
- E. It will convert the stubby area into a NSSA.
- F. It will disable OSPF auto-summary.

---

**Answer: B**

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To define an area as a stub area, use the **area stub** command in router configuration mode. To disable this function, use the **no** form of this command.

**area area-id stub [no-summary]**

**no area area-id stub**

**no area area-id**

#### Syntax Description

<b>area-id</b>	Identifier for the stub area; either a decimal value or an IP address.
<b>no-summary</b>	(Optional) Prevents an ABR from sending summary link advertisements into the stub area.

#### Defaults

No stub area is defined.

#### Command Modes

Router configuration

#### Command History

Release	Modification
10.0	This command was introduced.

#### Usage Guidelines

You must configure the **area stub** command on all routers and access servers in the stub area. Use the **area** router configuration command with the **default-cost** option to specify the cost of a default internal router sent into a stub area by an area border router.

There are two stub area router configuration commands: the **stub** and **default-cost** options of the **area** router configuration command. In all routers attached to the stub area, the area should be configured as a stub area using the **stub** option of the **area** command. Use the **default-cost** option only on an ABR attached to the stub area. The **default-cost** option provides the metric for the summary default route generated by the area border router into the stub area.

To further reduce the number of link state advertisements (LSAs) sent into a stub area, you can configure **no-summary** on the ABR to prevent it from sending summary LSAs (LSA type 3) into the stub area.

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## Question: 2

When troubleshooting OSPF neighbor errors, which three verification steps should be considered? (Choose three.)

- A. Verify if neighboring OSPF interfaces are configured in the same area.
- B. Verify if neighboring OSPF interfaces are configured with the same OSPF process ID.
- C. Verify if neighboring OSPF interfaces are configured with the same OSPF priority.
- D. Verify if neighboring OSPF interfaces are configured with the same hello and dead intervals.
- E. Verify if neighboring OSPF interfaces are configured with the same area type.

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**Answer: A, D, E**

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## Question: 3

On Cisco IOS XR Software, which set of commands is used to enable the gi0/0/0/1 interface for OSPF

in area 0?

- A. interface gi0/0/0/0  
ip address 10.1.1.1 255.255.255.0  
!  
router ospf 1  
network 10.1.1.1 0.0.0.0 area 0
- B. interface gi0/0/0/0  
ip address 10.1.1.1 255.255.255.0  
!  
router ospf 1  
network 10.1.1.1 255.255.255.255 area 0
- C. router ospf 1  
area 0  
interface GigabitEthernet0/0/0/1
- D. interface gi0/0/0/0  
ip address 10.1.1.1 255.255.255.0  
ip ospf 1 area 0
- E. router ospf 1  
address-family ipv4 unicast  
interface GigabitEthernet0/0/0/1 area 0
- F. router ospf 1  
address-family ipv4 unicast  
interface GigabitEthernet0/0/0/1  
area 0

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**Answer: C**

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#### **Question: 4**

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Which three statements are true regarding the OSPF router ID? (Choose three.)

- A. The OSPF routing process chooses a router ID for itself when it starts up.
- B. The router-id command is the preferred procedure to set the router ID.
- C. If a loopback interface is configured, its address will always be preferred as the router ID over any other methods.
- D. After the router ID is set, it does not change, even if the interface that the router is using for the router ID goes down. The router ID changes only if the router reloads or if the OSPF routing process restarts.
- E. In OSPF version 3, the OSPF router ID uses a 128-bit number.

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**Answer: A, B, D**

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#### **Question: 5**

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Which two OSPF network scenarios require OSPF virtual link configuration? (Choose two.)

- A. to connect an OSPF non-backbone area to area 0 through another non-backbone area
- B. to connect an NSSA area to an external routing domain
- C. to connect two parts of a partitioned backbone area through a non-backbone area
- D. to enable route leaking from Level 2 into Level 1
- E. to enable route leaking from Level 1 into Level 2
- F. to enable OSPF traffic engineering

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**Answer: A, C**

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### Question: 6

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What is function of the `RP/0/RSP0/CPU0:PE1(config-ospf)#distance` Cisco IOS-XR command?

- A. To modify the administrative distance of the OSPF routes
- B. To modify the default seed metric of the OSPF external routes
- C. To modify the OSPF default reference bandwidth
- D. To modify the OSPF cost

---

**Answer: A**

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[http://www.cisco.com/en/US/docs/ios\\_xr\\_sw/iosxr\\_r3.8/routing/command/reference/rr38ospf.pdf](http://www.cisco.com/en/US/docs/ios_xr_sw/iosxr_r3.8/routing/command/reference/rr38ospf.pdf)

## distance (OSPF)

To define an administrative distance, use the **distance** command in the appropriate mode. To remove the **distance** command from the configuration file and restore the system to its default condition in which the software removes a distance definition, use the **no** form of this command.

**distance** *weight* [*ip-address wildcard-mask* [*access-list-name*]]

**no distance** *weight ip-address wildcard-mask* [*access-list-name*]

Syntax	Description
<i>weight</i>	Administrative distance. Range is 10 to 255. Used alone, the <i>weight</i> argument specifies a default administrative distance that the software uses when no other specification exists for a routing information source. Routes with a distance of 255 are not installed in the routing table. Table 1 lists the default administrative distances.
<i>ip-address</i>	(Optional) IP address in four-part, dotted-decimal notation.
<i>wildcard-mask</i>	(Optional) Wildcard mask in four-part, dotted decimal format. A bit set to 1 in the <i>mask</i> argument instructs the software to ignore the corresponding bit in the address value.
<i>access-list-name</i>	(Optional) Name of an IP access list to be applied to incoming routing updates.

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### Question: 7

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Which four statements are correct regarding IS-IS operations? (Choose four.)

- A. By default, Level 1 routers within an IS-IS area do not carry any routing information external to the

area to which they belong. They use a default route to exit the area.

B. Summarization should be configured on the Level 2 routers, which injects the Level 2 routes into Level 1.

C. IS-IS supports "route leaking" in which selected Level 2 routes can be advertised by a Level 1/Level 2 router into Level 1.

D. The IS-IS backbone is a contiguous collection of Level 1 capable routers, each of which can be in a different area.

E. With IS-IS, an individual router is in only one area, and the border between areas is on the link that connects two routers that are in different areas.

F. Cisco IOS XR Software supports multitopology for IPv6 IS-IS unless single topology is explicitly configured in IPv6 address-family configuration mode.

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**Answer: A, C, E, F**

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[http://www.cisco.com/en/US/docs/ios\\_xr\\_sw/iosxr\\_r3.0/routing/configuration/guide/rc3isis#wp1148617](http://www.cisco.com/en/US/docs/ios_xr_sw/iosxr_r3.0/routing/configuration/guide/rc3isis#wp1148617)

#### Single-Topology IPv6 Support

Single-topology IPv6 support on Cisco IOS XR software allows IS-IS for IPv6 to be configured on interfaces along with an IPv4 network protocol. All interfaces must be configured with the identical set of network protocols and all routers in the IS-IS area (for Level 1 routing) or the domain (for Level 2 routing) must support the identical set of network layer protocols on all interfaces.

When single-topology support for IPv6 is used, only narrow link metrics, also known as old-style type, length, value (TLV) arguments, may be employed. During single-topology operation, one shortest path first (SPF) computation per level is used to compute both IPv4 and IPv6 routes. Using a single SPF is possible because both IPv4 IS-IS and IPv6 IS-IS routing protocols share a common link topology.

Because multitopology is the default behavior in the software, you must explicitly configure IPv6 to use the same topology as IPv4 in order to enable single-topology IPv6. Configure the single-topology command in ipv6 address family configuration submode of the IS-IS router stanza.

#### Multitopology IPv6 Support

Multitopology IPv6 support on Cisco IOS XR software differs from Cisco IOS software in that IS-IS assumes that multitopology support is required as soon as it detects interfaces configured for both IPv6 and IPv4 within the IS-IS stanza.

You must use the metric-style wide command to configure IS-IS to wide link metrics as multitopology link advertisements.

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### Question: 8

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When configuring IPv4 and IPv6 IS-IS routing on Cisco IOS XR routers, which three statements are correct? (Choose three.)

A. By default, a single SPF is used for both IPv4 and IPv6, so the IPv4 and IPv6 topology should be the same.

B. By default, the IS-IS router type is Level 1 and Level 2.

C. All IS-IS routers within the same IS-IS area must be configured with the same IS-IS routing process instance ID.

D. By default, metric-style narrow is used.

E. By default, the IS-IS interface circuit type is Level 1 and Level 2.

F. The area IS-IS address-family configuration command is used to specify the IS-IS area address.

---

**Answer: B, D, E**

---

```
is-type {level-1 | level-1-2 | level-2-only}
```

Example:

```
RP/0/RP0/CPU0:router(config-isis)# is-type level-2-only
```

(Optional) Configures the system type (area or backbone router).

- By default, every IS-IS instance acts as a **level-1-2** router.
- The **level-1** keyword configures the software to perform **Level 1** (intra-area) routing only. Only **Level 1** adjacencies are established. The software learns about destinations inside its area only. Any packets containing destinations outside the area are sent to the nearest **level-1-2** router in the area.
- The **level-2-only** keyword configures the software to perform **Level 2** (backbone) routing only and the router establishes only **Level 2** adjacencies, either with other **Level 2-only** routers or with **level-1-2** routers.
- The **level-1-2** keyword configures the software to perform both **Level 1** and **Level 2** routing. Both **Level 1** and **Level 2** adjacencies are established. The router acts as a border router between the **Level 2** backbone and its **Level 1** area.

The default metric style for single topology is narrow metrics. However, you can use either wide metrics or narrow metrics. How to configure them depends upon how single-topology is configured. If both IPv4 and IPv6 are enabled and single-topology is configured, the metric style is configured in the address-family ipv4 stanza. You may configure the metric style in the address-family ipv6 stanza, but it will be ignored in this case. If IPv6 only is enabled and single topology is configured, then the metric style is configured in the address-family ipv6 stanza.



<pre>circuit-type {level-1   level-2-only   level-1-2}</pre> <p><b>Example:</b> RP/0/RP0/CPU0:router(config-isis-if)# circuit-type level-1-2</p>	<p>(Optional) Configures the type of adjacency.</p> <ul style="list-style-type: none"> <li>The default <b>circuit</b> type is the configured system type (configured through the <b>is-type</b> command).</li> <li>Typically, <b>circuit</b> type needs to be configured when the router is configured only <b>level-1-2</b> and you want to constrain an interface to form only <b>level-1</b> or <b>level-2-only</b> adjacencies.</li> </ul>
--	--

### Question: 9

Refer to the PE1 router routing table output exhibit.

```
RP/0/RSP0/CPU0:PE1#show route ipv4 isis
```

```
<output omitted>
```

```
i su 10.1.10.0/24 [115/30] via 0.0.0.0, 00:40:34, Null0
```

```
i L1 10.1.10.1/32 [115/30] via 192.168.101.11, 00:42:39, GigabitEthernet0/0/0/0
```

```
i L1 10.1.10.2/32 [115/24] via 192.168.112.21, 00:44:40, GigabitEthernet0/0/0/1
```

```
i L1 10.1.10.3/32 [115/32] via 192.168.113.22, 00:38:23, GigabitEthernet0/0/0/2
```

```
i L1 10.1.10.4/32 [115/22] via 192.168.114.23, 00:14:10, GigabitEthernet0/0/0/3
```

```
<output omitted>
```

What is causing the i su 10.1.10.0/24 [115/30] via 0.0.0.0, 00:40:34, Null0 entry on the PE1 router routing table?

- A. The PE1 router is receiving the 10.1.10.0/24 summary route from the upstream L1/L2 IS-IS router.
- B. The PE1 router has been configured to summarize the 10.1.10.x/32 IS-IS routes to 10.1.10.0/24.
- C. The 10.1.10.0/24 has been suppressed because IS-IS auto-summary has been disabled on the PE1 router.
- D. The 10.1.10.0/24 has been suppressed because of a route policy configuration on the PE1 router.
- E. The 10.1.10.0/24 has been suppressed because the more specific 10.1.10.x/32 IS-IS routes have been configured to leak into the IS-IS non-backbone area.

**Answer: B**



Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP  
O - OSPF, IA - OSPF inter area, N1 - OSPF NSSA external type 1  
N2 - OSPF NSSA external type 2, E1 - OSPF external type 1  
E2 - OSPF external type 2, E - EGP, i - ISIS, L1 - IS-IS level-1  
L2 - IS-IS level-2, ia - IS-IS inter area  
su - IS-IS summary null, \* - candidate default  
U - per-user static route, o - ODR, L - local

---

**Question: 10**

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In comparing IS-IS with OSPF, a Level-1-2 IS-IS router is similar to which kind of OSPF router?

- A. ASBR on a normal OSPF area
- B. ASBR on NSSA
- C. ABR on totally stubby OSPF area
- D. ABR on stubby OSPF area
- E. ABR on a normal OSPF area

---

**Answer: C**

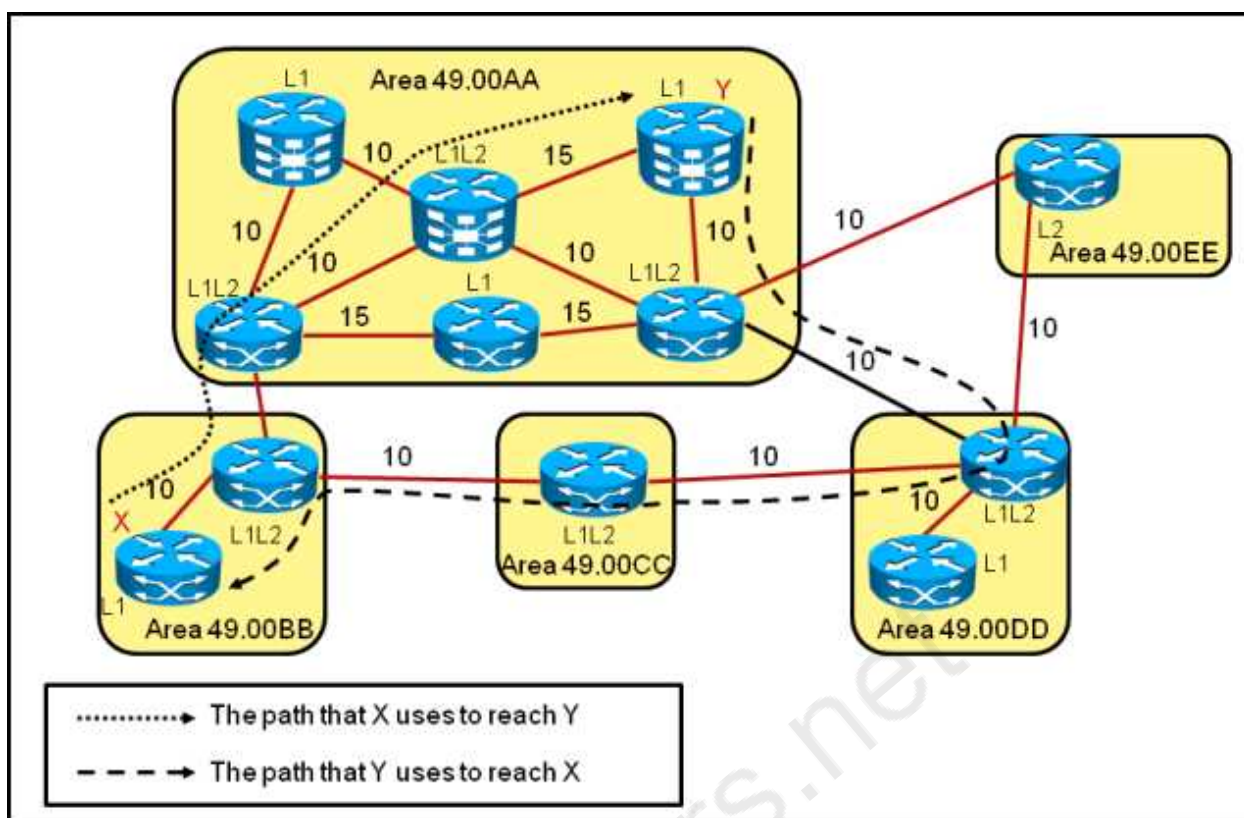
---

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**Question: 11**

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Refer to the topology diagram in the exhibit.



Which IS-IS feature could be implemented so that the return path for the packets from router Y in area 49.00AA to router X in area 49.00BB will use the more optimal path?

- A. Enable route leaking to pass Level 2 information into the Level 1 routers.
- B. Change the area 49.00AA type from a stub area to a regular area.
- C. Change the IS-IS administrative distance on router Y in area 49.00AA.
- D. Change the IS-IS metric type from narrow to wide on all IS-IS routers.

**Answer: A**

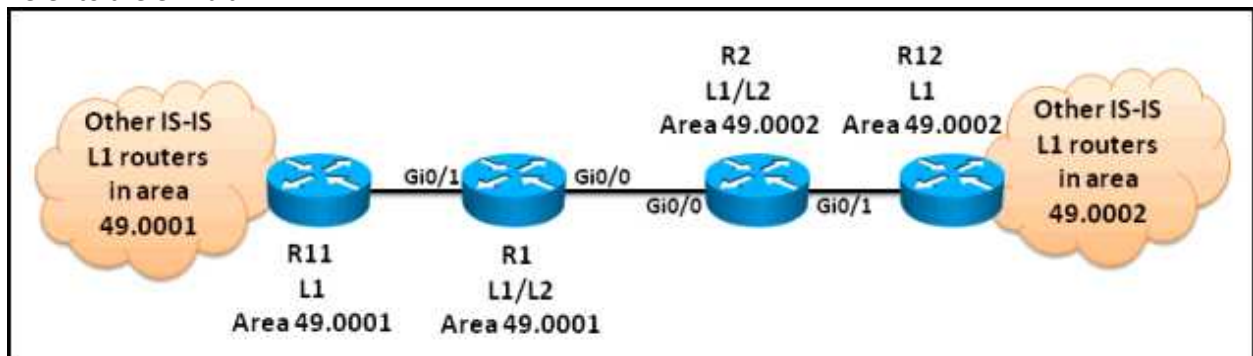
<http://www.cisco.com/application/pdf/paws/13796/route-leak.pdf>

The IS-IS routing protocol allows for a two-level hierarchy of routing information. There can be multiple Level 1 areas interconnected by a contiguous Level 2 backbone. A router can belong to Level 1, Level 2, or both. The Level 1 link-state database contains information about that area only. The Level 2 link-state database contains information about that level as well as each of the Level 1 areas. An L1/L2 router contains both Level 1 and Level 2 databases. It advertises information about the L1 area to which it belongs into L2. Each L1 area is essentially a stub area. Packets destined for an address that is outside of the L1 area are routed to the closest L1/L2 router to be forwarded on to the destination area. Routing to the closest L1/L2 router can lead to sub-optimal routing when the shortest path to the destination is through a different L1/L2 router.

Route leaking helps reduce sub-optimal routing by providing a mechanism for leaking, or redistributing, L2 information into L1 areas. By having more detail about inter area routes, an L1 router is able to make a better choice with regard to which L1/L2 router to forward the packet.

**Question: 12**

Refer to the exhibit.



Which two configuration options can be used to optimize the IS-IS network scenario? (Choose two.)

- A. Change the R1 and R2 IS type to Level 2.
- B. Change the R1 and R2 IS type to Level 1.
- C. Change the gi0/0 interface IS-IS circuit type on R1 and R2 to Level 2 only.
- D. Change the gi0/1 interface IS-IS circuit type on R1 and R2 to Level 1.
- E. Change the IS type for all the routers to Level-1-2.
- F. Change the IS-IS network type for all the routers to point-to-point.

---

**Answer: C, D**

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### Question: 13

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The Cisco IOS XE Software summary-address router IS-IS configuration command can be used to send a summarized route into which IS-IS hierarchy?

- A. Level 1 only
- B. Level 2 only
- C. Level-1-2 only
- D. Level 1 or Level 2 or Level-1-2

---

**Answer: D**

---

**summary-address (IS-IS)**

To create aggregate addresses for IS-IS, use the **summary-address** command in router configuration mode. To restore the default, use the **no** form of this command.

**summary-address** *address mask* {**level-1** | **level-1-2** | **level-2**}

**no summary-address** *address mask* {**level-1** | **level-1-2** | **level-2**}

**Syntax Description**

<b>address</b>	Summary address designated for a range of addresses.
<b>mask</b>	IP subnet mask used for the summary route.
<b>level-1</b>	Only routes redistributed into Level 1 are summarized with the configured address and mask value.
<b>level-1-2</b>	Summary routes are applied when redistributing routes into Level 1 and Level 2 IS-IS, and when Level 2 IS-IS advertises Level 1 routes as reachable in its area.
<b>level-2</b>	Routes learned by Level 1 routing are summarized into the Level 2 backbone with the configured address and mask value. Redistributed routes into Level 2 IS-IS will be summarized also.

**Question: 14**

Refer to the Cisco IOS XE IS-IS configuration exhibit.

```

interface GigabitEthernet0/0/0
ip address 192.168.104.40 255.255.255.0
ip router isis
ipv6 address 2001:DB8:192:168:104::40/80
ipv6 enable
ipv6 router isis
!
interface GigabitEthernet0/0/1
ip address 192.168.134.40 255.255.255.0
ip router isis
ipv6 address 2001:DB8:192:168:134::40/80
ipv6 enable
ipv6 router isis
!
router isis 1
net 49.0004.0100.0400.1001.00
summary-address 10.4.10.0 255.255.255.0
!

```

What are two problems with the configuration that are causing the IPv4, or the IPv6, or the IPv4 and IPv6 IS-IS operations to fail? (Choose two.)

- A. The configuration is missing the interface gi0/0 and interface gi0/0 commands under router isis 1.
- B. The configuration is missing the address-family ipv4 unicast and address-family ipv6 unicast commands under router isis 1.
- C. IPv6 unicast routing has not been enabled globally on the Cisco IOS XE router.
- D. The gi0/0 and gi0/1 interfaces are not participating in the router isis 1 routing instance.
- E. Multitopology IS-IS must be enabled to support both IPv4 and IPv6.

F. Another router isis instance must be enabled to support IPv6.

---

**Answer: C, D**

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[http://www.cisco.com/en/US/docs/switches/metro/me3400/software/release/12.2\\_50\\_se/configuration/guide/swipv6.pdf](http://www.cisco.com/en/US/docs/switches/metro/me3400/software/release/12.2_50_se/configuration/guide/swipv6.pdf)

- When using user-network interface (UNI) or enhanced network interface (ENI) ports for any IPv6-related features, you must first globally enable IP routing and IPv6 routing on the switch by entering the ip routing ipv6 unicast-routing

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### Question: 15

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In which network environment is IS-IS adjacency check important?

- A. in a multitopology environment where there are different instances of IS-IS running on the same router
- B. in an IPv4/IPv6 environment and running single-topology IS-IS
- C. when a level L1/L2 IS-IS router is neighboring with a Level 1 only or Level 2 only router
- D. when IS-IS neighbors are in an NBMA environment like over Frame Relay
- E. when IS-IS neighbors are in a broadcast environment like an Ethernet LAN

---

**Answer: B**

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#### Disabling IPv6 Protocol-Support Consistency Checks

Perform this task to disable protocol-support consistency checks in IPv6 single-topology mode.

For single-topology IS-IS IPv6, routers must be configured to run the same set of address families. IS-IS performs consistency checks on hello packets and will reject hello packets that do not have the same set of configured address families. For example, a router running IS-IS for both IPv4 and IPv6 will not form an adjacency with a router running IS-IS for IPv4 or IPv6 only. In order to allow adjacency to be formed in mismatched address-families network, the adjacency-check command in IPv6 address family configuration mode must be disabled.

---

Entering the no adjacency-check command can adversely affect your network configuration. Enter the no adjacency-check command only when you are running IPv4 IS-IS on all your routers and you want to add IPv6 IS-IS to your network but you need to maintain all your adjacencies during the transition. When the IPv6 IS-IS configuration is complete, remove the no adjacency-check command from the configuration.

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